KIESELMANN
FLUID PROCESS GROUP

Operating instructions

- Translation of the original -

KI-DS
Double sealing single seat valves
Type: 5521, 5522, 5523, 5524

pneumatic and manual operation

English **GBR**

10.9.15

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1. List of contents

1. List of contents 2

2. General safety instructions 3
   - 2.1 Information for your safety 3
   - 2.2 Marking of security instructions in the operating manual 3
   - 2.3 Designated use 3
   - 2.4 Personnel 3
   - 2.5 Modifications, spare parts, accessories 3
   - 2.6 General instructions 3

3. Safety instructions 4
   - 3.1 Field of application 4
   - 3.2 General safety instructions 4
   - 3.3 General notes 4

4. Installation informations 4
   - 4.1 Installation instructions 4
   - 4.2 Welding guidelines 4
   - 4.3 ATEX guidelines 4

5. Function 5
   - 5.1 Functional description 5
   - 5.2 Basic position for pneum. operation valves 5

6. Service and maintenance 6
   - 6.1 Maintenance 6
   - 6.2 Cleaning 6

7. Control system - and interrogation system 6
   - 7.1 Control head -optional- 6
   - 7.2 Sensor mounting set -optional- 6

8. Technical data 7

9. Pneumatic valve actuation 7
   - 9.1 Actuator: air open - spring close (NC) 7

10. Disassembly and assembly 8
    - 10.1 Disassembly 8
    - 10.2 Assembly 9

11. Drawing 10
    - 11.1 Pilot valves (EV) and (AV) 11

12. Dimensions 12
    - 12.1 Size measurement table 12
    - 12.2 Dimensioned drawing 12

13. Wearing parts 13
    - 13.1 Valve insert (VE) 13
    - 13.2 Pilot valve (AV) and (EV) 13
    - 13.3 Seal kits D1 - D7, D9 - D14 13

14. Manufacturing 14
    - 14.1 Structure of Article number 14

15. Declaration of incorporation 15

2. General safety instructions

2.1 Information for your safety

We are pleased that you have decided for a high-class KIESELMANN product. With correct application and adequate maintenance, our products provide long time and reliable operation.

Before installation and initiation, please carefully read this instruction manual and the security advices contained in it. This guarantees reliable and safe operation of this product and your plant respectively. Please note that an incorrect application of the process components may lead to great material damages and personal injury.

In case of damages caused by non observance of this instruction manual, incorrect initiation, handling or external interference, guarantee and warranty will lapse!

Our products are produced, mounted and tested with high diligence. However, if there is still a reason for complaint, we will naturally try to give you entire satisfaction within the scope of our warranty. We will be at your disposal also after expiration of the warranty. In addition, you will also find all necessary instructions and spare part data for maintenance in this instruction manual. If you don't want to carry out the maintenance by yourself, our KIESELMANN service team will naturally be at your disposal.

2.2 Marking of security instructions in the operating manual

Hints are available in the chapter "safety instructions" or directly before the respective operation instruction. The hints are highlighted with a danger symbol and a signal word. Texts beside these symbols have to be read and adhered to by all means. Please continue with the text and with the handling at the valve only afterwards.

Symbol	Signal word	Meaning
	DANGER	Imminent danger which may cause severe personal injury or death.
	ATTENTION	Dangerous situation which may cause slight personal injury or material damages.
	NOTE	Marks application hints and other information which is particularly useful.

2.3 Designated use

The fitting is designed exclusively for the purposes described below. Using the fitting for purposes other than those mentioned is considered contrary to its designated use. KIESELMANN cannot be held liable for any damage resulting from such use. The risk of such misuse lies entirely with the user. The prerequisite for the reliable and safe operation of the fitting is proper transportation and storage as well as competent installation and assembly.

Operating the fitting within the limits of its designated use also involves observing the operating, inspection and maintenance instructions.

2.4 Personnel

Personnel entrusted with the operation and maintenance of the tank safety system must have the suitable qualification to carry out their tasks. They must be informed about possible dangers and must understand and observe the safety instructions given in the relevant manual. Only allow qualified personnel to make electrical connections.

2.5 Modifications, spare parts, accessories

Unauthorized modifications, additions or conversions which affect the safety of the fitting are not permitted. Safety devices must not be bypassed, removed or made inactive. Only use original spare parts and accessories recommended by the manufacturer.

2.6 General instructions

The user is obliged to operate the fitting only when it is in good working order. In addition to the instructions given in the operating manual, please observe the following:

- relevant accident prevention regulations
- generally accepted safety regulations
- regulations effective in the country of installation
- working and safety instructions effective in the user's plant.

3. Safety instructions

3.1 Field of application

The single valves are utilised as a pneumatically controlled shut-off valve in food and beverage as well as in pharmaceutical, biotechnological and chemical industries.

ATTENTION

- To avoid danger and damage, the fitting must be used in accordance with the safety instructions and technical data contained in the operating instructions.

3.2 General safety instructions

DANGER

- Danger of crushing or amputating limbs.
  Do not reach into the valve housing when in pneumatic mode.
- Dismantling the valve or valve assemblies from the plant can cause injuries from fluids or gases flowing out.
  Dismantle the valve or valve assembly only when the plant has been rendered pressure-less and free of liquid and gas.
- The spring preloaded valve insert (air open - spring close) may incur serious injuries by jumping out of the housing.
  Pneumatically open the valve before disassembling the clamp coupling, so that upstroke the piston in direction “X“ (Fig. A1 /page 8)
- For valves or plants/installations that are operated in a ATEX area, must be considered the valid ATEX Guidelines EG and the Installation instructions (see “ATEX guidelines” on page 4.).

ATTENTION

- To avoid air leaking, only use pneumatic connection parts that have an o-ring seal facing the even surface.
- When mounting the clamps, the max. torque must not be exceeded (see technical data).
- Steps should be taken to ensure that no external forces are exerted on the fitting.

3.3 General notes

NOTE

- All data are in line with the current state of development. Subject to change as a result of technical progress.

4. Installation informations

4.1 Installation instructions

The single seat valve must be preferable vertically installed with the actuator upwards. Liquid must be able to flow freely from the valve housing and the leakage chamber.

NOTE

If installed horizontally, some minor residual liquids will remain in the ball-shape of the housing.

4.2 Welding guidelines

Sealing elements integrated in weld components must generally be removed prior to welding.

To prevent damage, welding should be undertaken by certified personnel (EN287). Use the TIG (Tungsten Inert Gas) welding process.

NOTE

Impurities can cause damage to the seals and seals area. Clean inside areas prior to assembly.

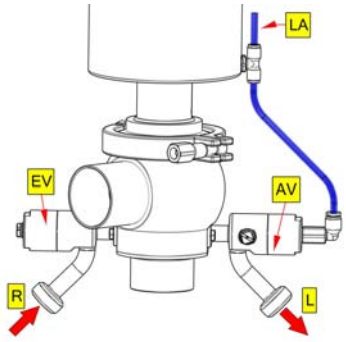
To avoid a distortion of the components, all welding parts must be welded to stress-relieved.

4.3 ATEX guidelines

For valves or plants/installations that are operated in the ATEX area, sufficient bonding (grounding) must be ensured (see valid ATEX Guidelines EG).

5. Function

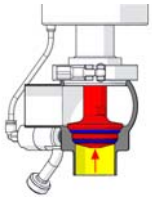
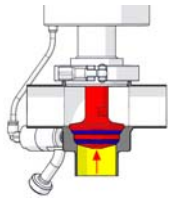
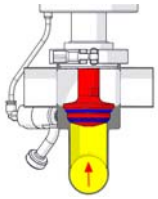
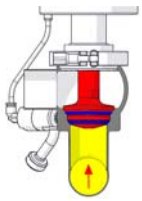
5.1 Functional description



- **Function of valve:** The sealing function in the closed position is performed statically. Leakage which occurs due to damaged valve disc seals is discharged into the atmosphere without pressure via the leakage outlet (L) at the outlet valve (AV).
- **Operation:** pneumatic operation by a lift drive (air/spring)
- **Activation:** Pneumatically over a 3/2-way solenoid valve.
(see “Pneumatic valve actuation” on page 7.)

- **air open - spring close (NC) Basic position: Valve close (Fig. I - IV)**
  - ▶ pneum. operated ⇨ opens the valve
  - ▶ not pneum. operated ⇨ spring force closes the valve

5.2 Basic position for pneum. operation valves

Angle valve Type: 5521 S-S air open - spring close (NC) **Basic position: Valve close**	 Fig. I
T-valve Type: 5522 SS-S air open - spring close (NC) **Basic position: Valve close**	 Fig. II
Cross valve Type: 5523 SS-SS air open - spring close (NC) **Basic position: Valve close**	 Fig. III
Loop valve Type: 5524 S-SS air open - spring close (NC) **Basic position: Valve close**	 Fig. IV

6. Service and maintenance

6.1 Maintenance

The maintenance intervals depend on the operating conditions

- temperature, temperature-intervals
- medium and cleaning medium
- pressure and opening frequency

We recommend replacing the seals every 1 years. The user, however should establish appropriate maintenance intervals according to the condition of the seals.

NOTE

		Lubricant recommendation
EPDM; Viton; k-flex; NBR; HNBR	⇨	Klüber Paraliq GTE703*
Silicone	⇨	Klüber Sintheso pro AA2*
Thread	⇨	Interflon Food*

**) It is only permitted to use approved lubricants, if the respective fitting is used for the production of food or drink. Please observe the relevant safety data sheets of the manufacturers of lubricants.*

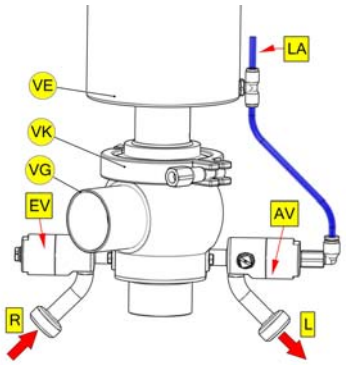
➤ **Actuator**

The actuator is maintenance-free and non-removable.

6.2 Cleaning

The cleaning of the valve housing is performed with the pipe cleaning system.

Through the inlet valve (EV), the leakage area between the piston seals can be cleaned or steam-cleaned in observance of the technical data.



7. Control system - and interrogation system

7.1 Control head -optional-

Optionally, modular valve control systems can be installed to the actuator for reading and actuating valve positions. The standard version is a closed system with twofold limit position messaging (standard), with SPS, Interbus or ASI bus switch-on electronics, and integrated 3/2-way solenoid valves. For tough operating conditions we recommend employing a stainless steel hood.

7.2 Sensor mounting set -optional-

For the acquisition of the valve positions over inductive initiators, a limit switch support is mounted on the actuation. The enquiry takes place over the position of the piston rod.

8. Technical data

Model:	Double sealing single seat valve - pneumatic operation
Valve size:	DN 25 - DN 100 DN 1 inch - DN 4 inch
Connections:	Welding end DIN EN10357
Temperature range:	• Ambient temperature: +4° to +45°C • Product temperature: +0° to +95°C medium dependent • Sterilization temperature: EPDM +140°C short-time (30 min.) HNBR +130°C short-time (30 min.)
Control air pressure::	DN 25 - DN 65 I DN 1“ - DN 2½“ = min. 5,5 bar - 8,0 bar DN 80 - DN 100 I DN 1“ - DN 4“ = min. 6,0 bar - 8,0 bar
Pressure Nominal (bar):	PN10
Quality of control air:	ISO 8573-1 : 2001 quality class 3

Material:	**in product contact**	**not in product contact**
Stainless steel:	1.4404 / AISI316L	1.4301 / AISI304 1.4305 / AISI303
Surfaces:	RA ≦0,8µm	metallic bright, e-pol.
Seal:	EPDM (FDA) HNBR (FDA)	HNBR

	Nominal diameter						
	DIN	25	40	50	65	80	100
	Inch	1	1½	2	2½	3	4
max. Operation pressure:	(bar)	10	8	8	8	10	6

Tightening moment:	DIN	25	40	50	65	80	100
(Clamp coupling)	Inch	1	1½	2	2½	3	4
Torque	(Nm)	15	15	15	15	15	55

9. Pneumatic valve actuation

9.1 Actuator: air open - spring close (NC)

Valve function	pneumatic control with solenoid valve (MV) in control unit (Fig. 1 /page 7)	pneumatic control with external solenoid valve (MV) (Fig. 2 /page 7)
Valve “OPEN“	control air feed P ➟ MV1 ➟ P1 I LA/LV Valve is opening by control air	control air feed ext. MV ➟ LA Valve is opening by control air
Valve “CLOSED“	de-aeration LA/LV I P1 ➟ MV1 ➟ R Valve is closing by spring	de-aeration LA ➟ ext. MV Valve is closing by spring

MV = solenoid valve
R = de-aeration, sound absorber
P = compressed-air inlet (control unit)
S = slide switch - manual control (solenoid valves)
I = initiators
H = angle bracket
E = de-aeration
LA = air connection
AV = Outlet valve
EV = Inlet valve (optional)

Control head with MV

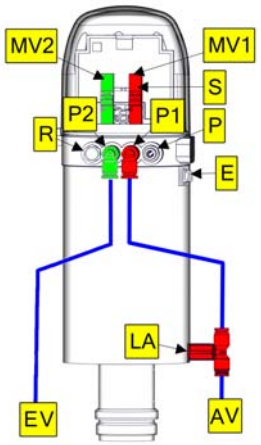


Fig. 1

Sensors

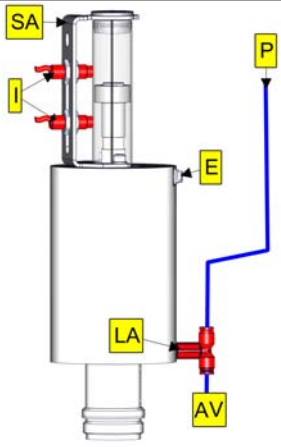


Fig. 2

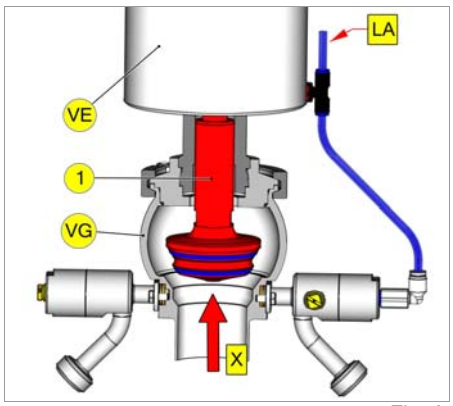


Fig. A1

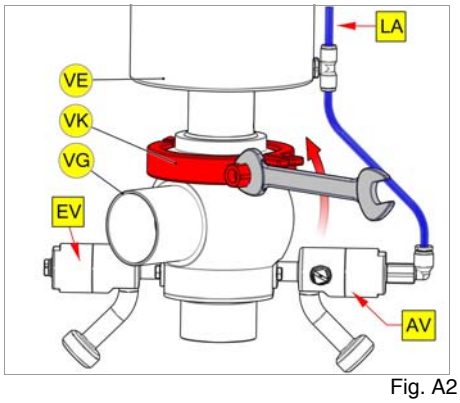


Fig. A2

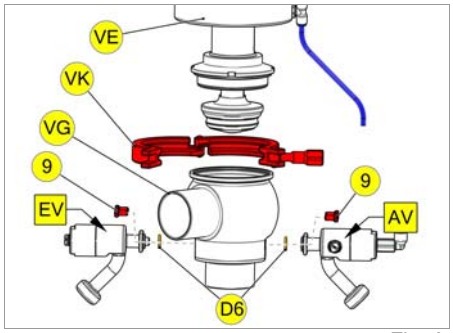


Fig. A3

10. Disassembly and assembly

NOTE
- All threaded joint have right-hand thread.
- Unscrew and remove control air, steam resp. cleaning lines and electrical lines, complete sensor mounting or control head.
- Don´t damage the surfaces onto the piston.

10.1 Disassembly

➢ Remove pneum. valve insert

A1 ⇨ • Connect compressed air at the connection LA. The valve opens automatically. The piston moves in position „OPEN“.

A2 ⇨ • Unscrew the clamp coupling (VK). Disconnect the compressed air pipe from connection LA, from outlet valve LV and inlet valve EV.
ⓘ The piston moves back in position „CLOSED“.

A3 ⇨ Dismount the valve insert (VE) out of the housing (VG).

➢ Exchanging seals (D1) - (D6)

A3 ⇨ • Unscrew the screw (9) and remove the pilot valves (EV) and (AV). Remove seal (D6).

A4 ⇨ Unscrew the piston (1) from spindle (6) (SW1/SW2)

A5 ⇨ Dismantle O-rings (D1a),(D1b) and (D2).

NOTE
Puncture the O-ring (D1a) and (D1b) at the centre with a pointed tool and remove them carefully from the groove.

A6 ⇨ • Unscrew the insert (2) from the lantern (4) (use a hook wrench).

A7 ⇨ • Remove seal (D3).

NOTE
Bearing bush (3) and (5) and the O-rings (D4) and (D5) do not need to be removed for seal change. The races are not included in the seal set. If they are worn, please order them with the seals (see wearing parts set).

A8 ⇨ • Unsrew the lantern (4) from the actuator (7) (use a hook wrench) and remove lantern from the spindle (6). Unscrew insert (8) from the actuator (7) (use a pin type face wrench).

A9 ⇨ • Dismantle O-rings (D4) and (D5). Exchange seals and wear parts.

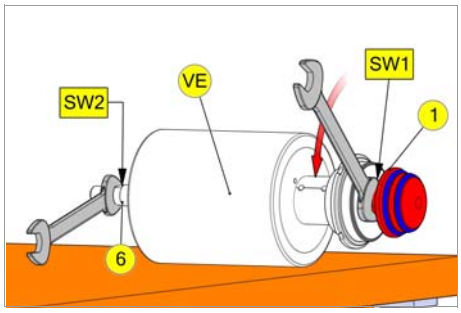


Fig. A4

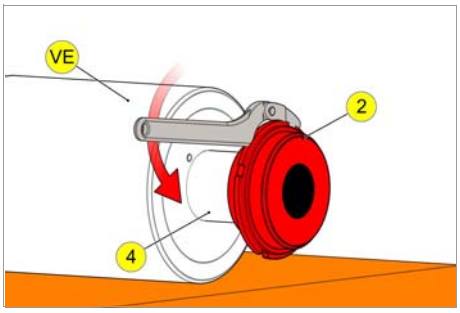


Fig. A6

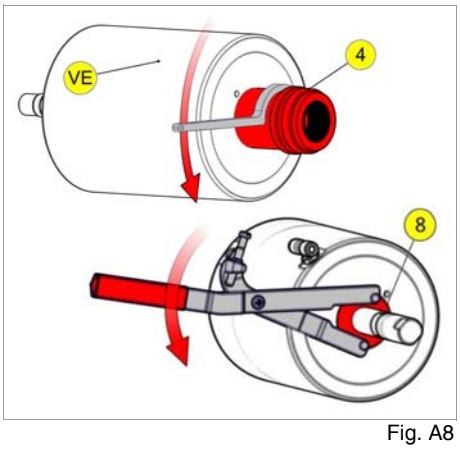


Fig. A8

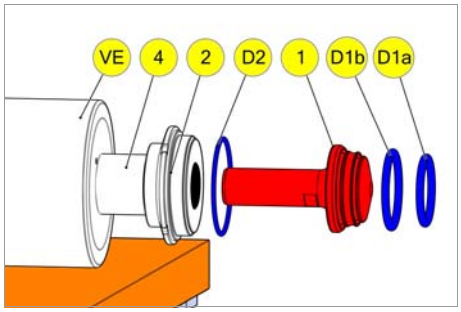


Fig. A5

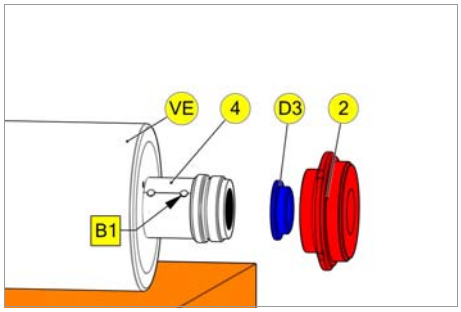


Fig. A7

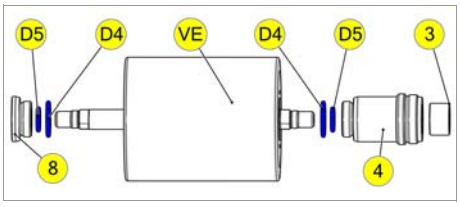


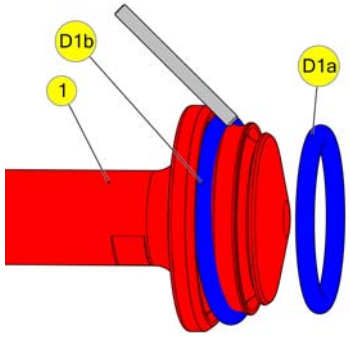
Fig. A9

10.2 Assembly

- Thoroughly clean and slightly lubricate mounting areas and running surfaces.
  Assemble in reverse order.

NOTE
Alternately press and roll the seal (D1a) and (D1b) into the groove with round body (see Assembly Fig. B1).

- Check the valve function.



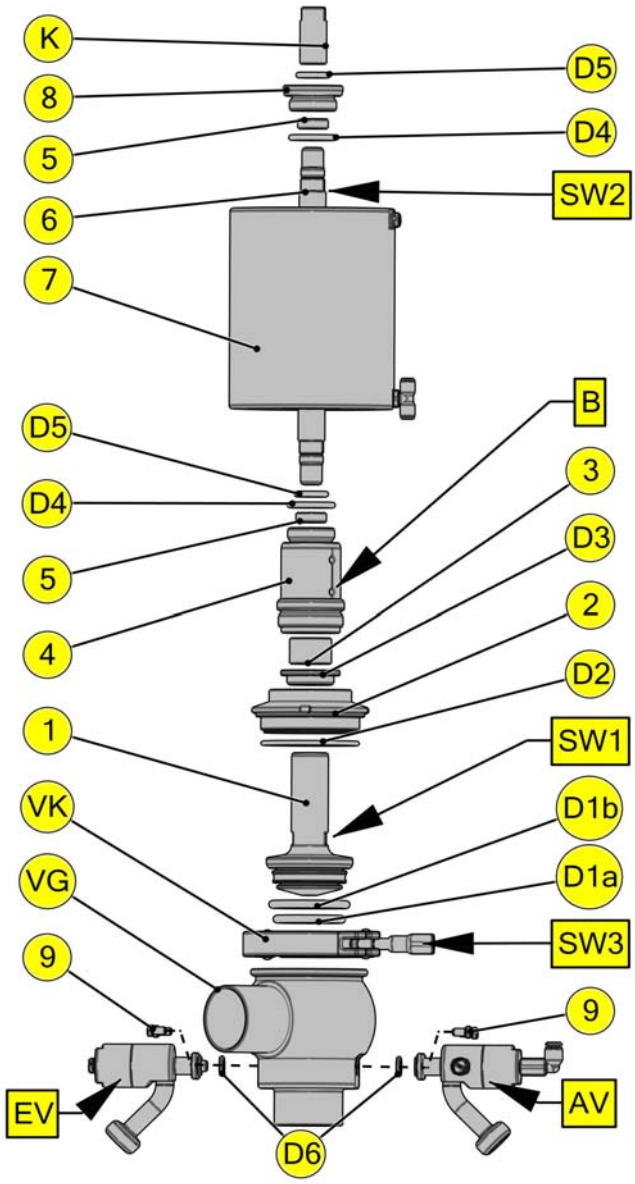
Assembly Fig. B1

1 = Piston
2 = Insert
3 = Bearing bush
4 = Lantern
5 = Bearing bush
6 = Spindle
7 = Actuator
8 = Lantern insert
9 = Screw

D1a = O-ring
D1b = O-ring
D2 = O-ring
D3 = Seal
D4 = O-ring
D5 = O-ring
D6 = Seal

B = Bore
K = Cap
AV = Outlet valve
EV = Inlet valve
VG = Valve housing
VK = Clamp coupling

SW1 = 24
SW2 = 17
SW3 = 16



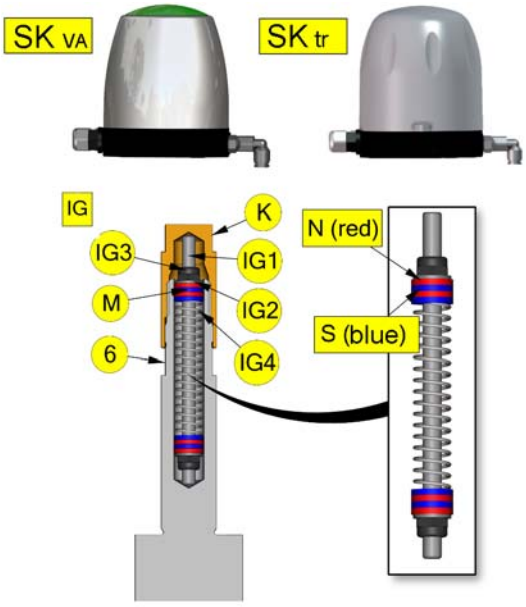
Assembly Fig. B2

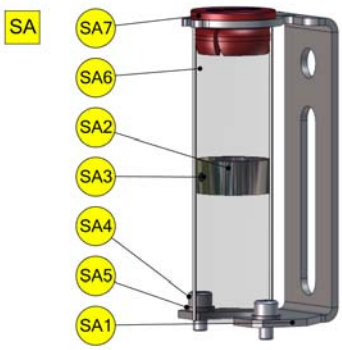
11. Drawing

K = Cap
L = Leakage connection
AV = Outlet valve
R = Cleaning connection
EV = Inlet valve
VE = Valve insert pneumatical
VK = Clamp coupling
VG = Valve housing

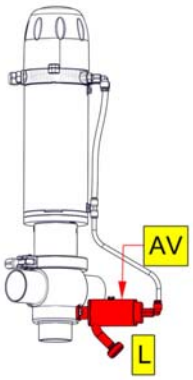
SKva = Control head with stainless steel cap + 360° flashing light
SKtr = Control head with plastic cap
IG = Position indication
IG1 = Threaded rod
IG2 = Disc
IG3 = Nut
IG4 = Spring
M = Magnet (N-north / S-south)

SA = Sensor mounting
SA1 = Bracket
SA2 = Switch cam
SA3 = Setscrew
SA4 = Screw
SA5 = Disc
SA6 = Sleeve transparent
SA7 = Cover

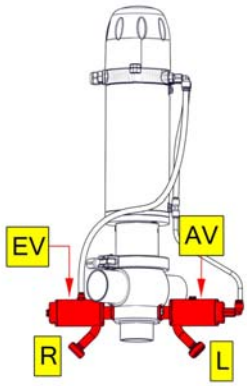


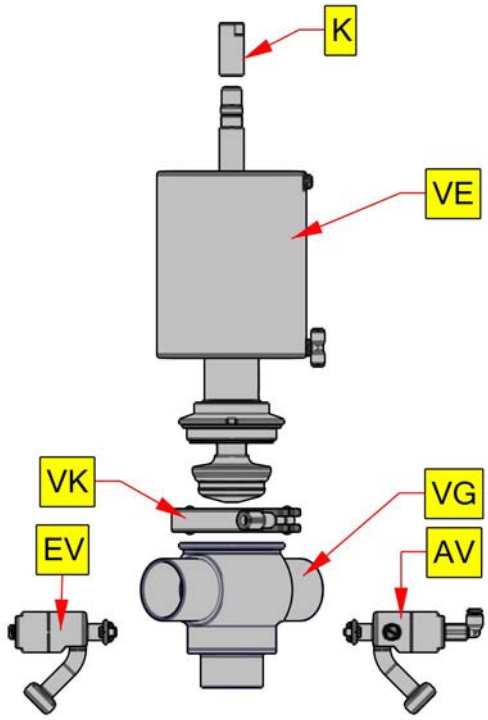


with Outlet valve AV



with Inlet valve EV and Outlet valve AV





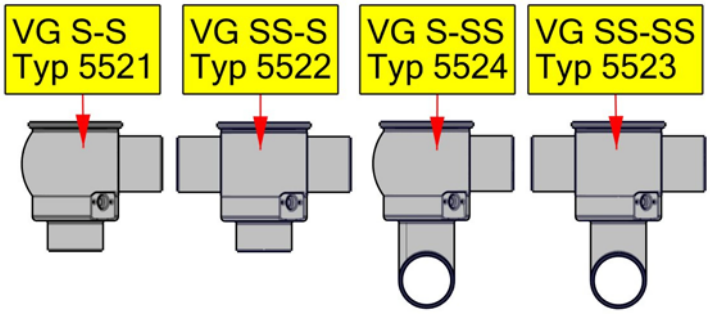


Fig. 3

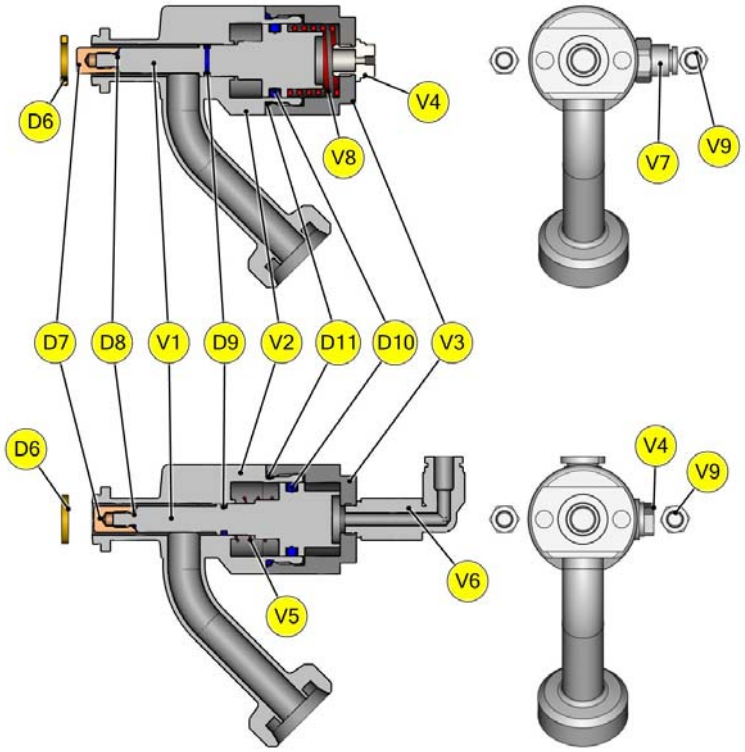
11.1 Pilot valves (EV) and (AV)

V1 = Piston
V2 = Housing
V3 = Housing cover
V4 = Screw plug
V5 = Spring
V6 = Push-in connector elbow
V7 = Push-in connector straight
V8 = Spring
V9 = Screws

D6 = Seal
D7 = Piston
D8 = O-ring
D9 = O-ring
D10 = O-ring
D11 = O-ring

Inlet valve (EV)

Outlet valve (AV)



Inlet valve (EV)

Outlet valve (AV)

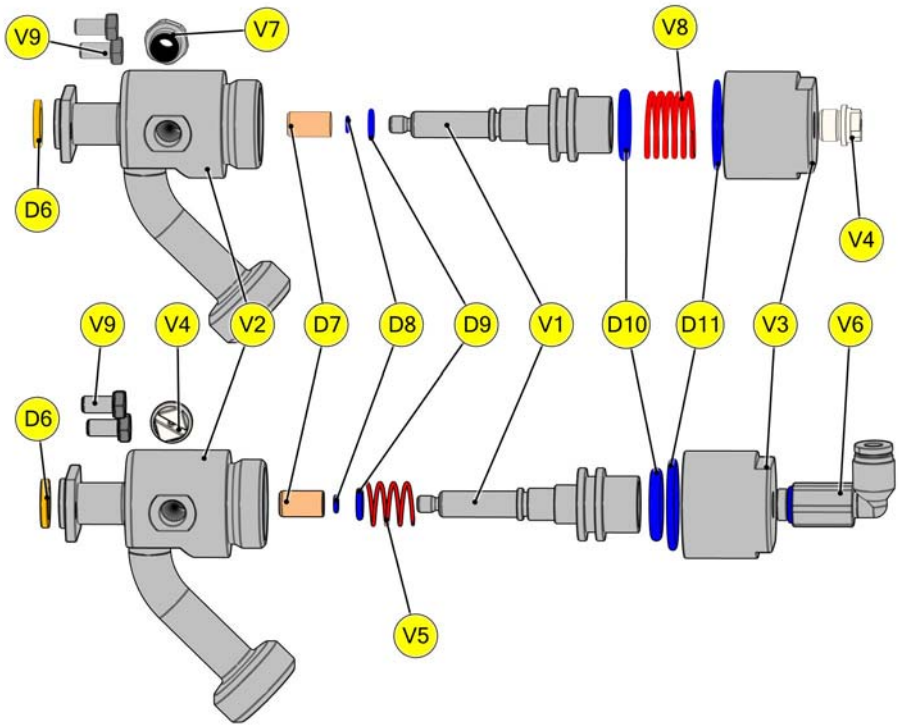


Fig. 4

12. Dimensions

12.1 Size measurement table

DN	d1	d2	L1	L2	L3	L4	L5	L6	L7	M1 installation dimension	H (stroke)
25 **1“**	29x1,5 25,4x1,65	104	75	150	330 332	81 85	91 89	100	275	445	12 8
40 **1½“**	41x1,5 38,1x1,65	104	85	170	324 326	69 72,5	108 105	120	275	445	24 20,5
50 **2“**	53x1,5 50,8x1,65	129	85	170	330 331	69 71,5	115 112,5	140	268	470	24,5 21,5
65 **2½“**	70x2,0 63,5x1,65	167	105	210	338 341,5	69 75	145 141	160	300	500	24 18
80 **3“**	85x2,0 76,1x2	230	115	230	341 337	64,5 64,5	162 159	180	318	515	28,5 28,5
100 **4“**	104x2,0 101,6x2	230	130	260	350,5 351,5	64,5 67	167 186	200	342	550	28,5 26

Valves that do not meet the catalogue standards, can lead to dimensional deviations.

12.2 Dimensioned drawing

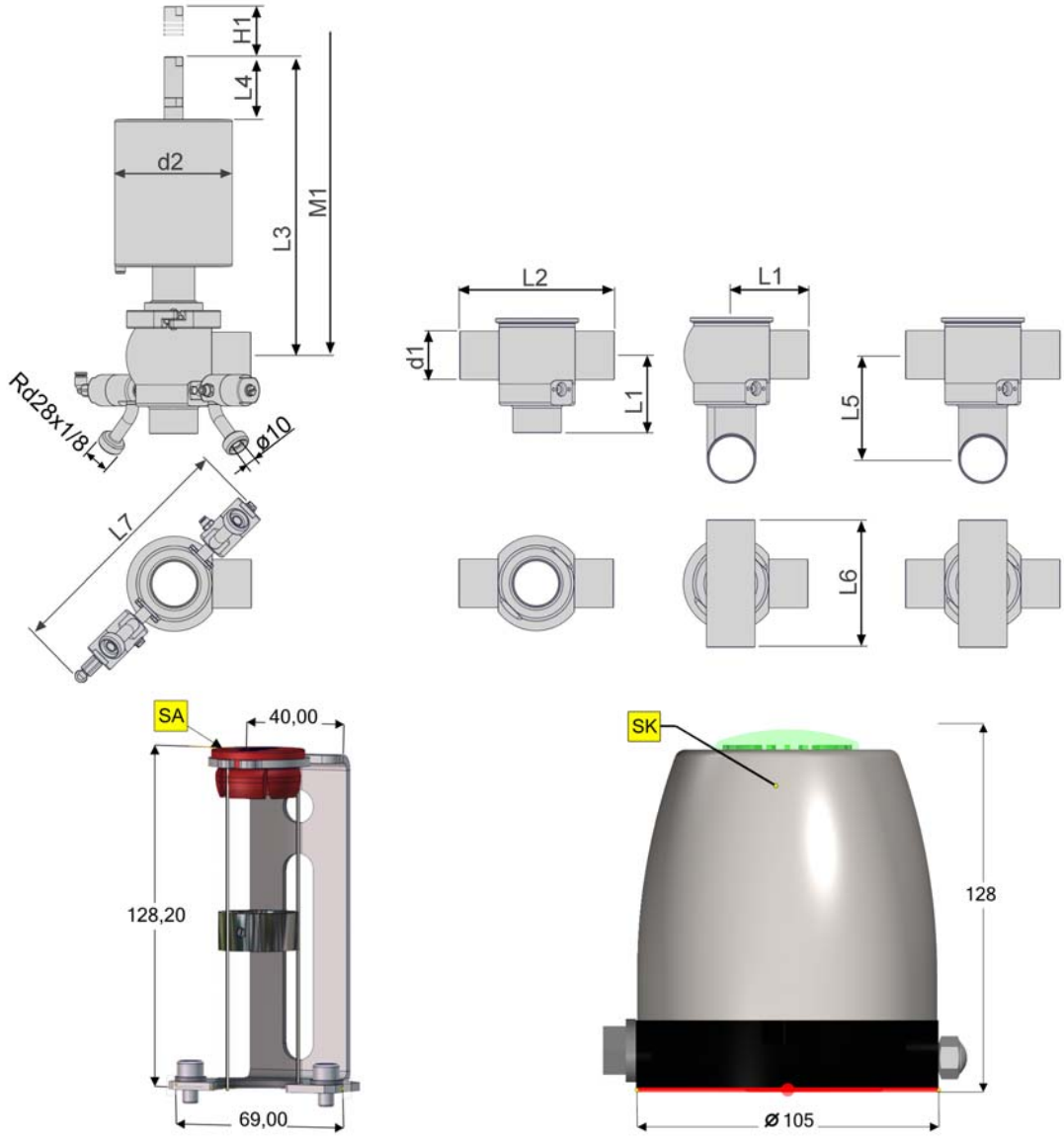


Fig. 5

13. Wearing parts

13.1 Valve insert (VE)

Pos.	Material	Pce	DN 25 1 Inch	DN 40 1½ Inch	DN 50 2 Inch	DN 65 2½ Inch	DN 80 3 Inch	DN 100 4 Inch
3	XSM	(1x)	Bearing bush 8050 028 020-156					
5	XMS	(2x)	Bearing bush 8500 020 007-156					
D1a	EPDM HNBR	(1x)	O-ring 2304 022 035-159 2304 022 035-157	O-ring 2304 032 035-159 2304 032 035-157	O-ring 2304 044 053-159 2304 044 053-157	O-ring 2304 053 053-159 2304 053 053-157	O-ring 2304 069 053-159 2304 069 053-157	O-ring 2304 088 053-159 2304 088 053-157
D1b	EPDM HNBR	(1x)	O-ring 2304 036 035-159 2304 036 035-157	O-ring 2304 041 035-159 2304 041 035-157	O-ring 2304 050 053-069 2304 050 053-157	O-ring 2304 063 053-159 2304 063 053-157	O-ring 2304 079 053-170 2304 079 053-157	O-ring 2304 098 053-170 2304 098 053-157
D2	EPDM HNBR	(1x)	O-ring 2304 069 026-159 2304 069 028-050	O-ring 2304 069 026-159 2304 069 028-050	O-ring 2304 069 026-159 2304 069 028-050	O-ring 2304 082 026-159 2304 082 026-050	O-ring 2304 098 035-159 2304 098 035-050	O-ring 2304 117 035-159 2304 117 035-050
D3	EPDM HNBR	(1x)	Seal 5506 050 009-054 5506 050 009-050	Seal 5506 050 009-054 5506 050 009-050	Seal 5506 050 009-054 5506 050 009-050	Seal 5506 050 009-054 5506 050 009-050	Seal 5506 050 009-054 5506 050 009-050	Seal 5506 050 009-054 5506 050 009-050
D4	NBR	(2x)	O-ring 2304 030 035-055					
D5	HNBR	(2x)	O-ring 2304 019 035-171					
D6	k-flex	(2x)	Seal 2353 021 016-114					

13.2 Pilot valve (AV) and (EV)

Pos.	Material	Pce	Outlet valve (AV) 5522 150 060-041	Inlet valve (EV) 5522 150 050-041
D7	k-flex	(1x)	Piston 5522 150 055-114	Piston 5722 150 055-114
D8	EPDM	(1x)	O-ring 2304 004 010-054	O-ring 2304 004 010-054
D9	EPDM	(1x)	O-ring 2304 007 015-159	O-ring 2304 007 015-159
D10	Viton	(1x)	O-ring 2304 017 030-055	O-ring 2304 017 030-055
D11	NBR	(1x)	O-ring 2304 024 020-055	O-ring 2304 024 020-055

13.3 Seal kits D1 - D7, D9 - D14

Material	DN 25 1 Inch	DN 40 1½ Inch	DN 50 2 Inch	DN 65 2½ Inch	DN 80 3 Inch	DN 100 4 Inch
HNBR	5522 025 990-050	5522 040 990-050	5522 050 990-050	5522 065 990-050	5522 080 990-050	5522 100 990-050
EPDM	5522 025 990-054	5522 040 990-054	5522 050 990-054	5522 065 990-054	5522 080 990-054	5522 100 990-054

14. Manufacturing

14.1 Structure of Article number

5521 050 130 - 041

- 041 — Material in product contact / Exterior finish / Interrogation system
- 130 — Material seals in product contact / Construction modifications
- 050 — Valve size (Nominal pipe size)
- 050 — Housing type
- 5521 — Product type

➤ Product type

552x = Double sealing single seat valve

➤ Housing type

Angle-housing S-S Typ: 5521	T-housing SS-S Typ: 5522	Cross-housing SS-SS Typ: 5523	Loop-housing S-SS Typ: 5524

➤ Valve size

DN = Nominal diameter

DIN	**025** = DN 25	**040** = DN 40	**050** = DN 50	**065** = DN 65	**080** = DN 80	**100** = DN 100
INCH	**026** = DN 1	**038** = DN 1½	**051** = DN 2	**064** = DN 2½	**076** = DN 3	**101** = DN 4

➤ Material seal / Construction modifications

Material seals in product contact:			- EPDM	- HNBR
Modifications:	Type of actuation:	- air open - spring close		
	Pilot valves:	- with Outlet valve	552x DN 030-xxx	552x DN 035-xxx
		- with Outlet valve and Inlet valve	552x DN 130-xxx	552x DN 135-xxx

➤ Material in product contact / Exterior finish

020 - 1.4301 / AISI304	- bright turned		**040** - 1.4404 / AISI316L	- bright turned
021 - 1.4301 / AISI304	- E-polished		**041** - 1.4404 / AISI316L	- E-polished
022 - 1.4301 / AISI304	- unpolished, glass-bead blasted		**042** - 1.4404 / AISI316L	- unpolished, glass-bead blasted

➤ Interrogation system

Article number	Control System or Interrogation System (A1, A2)
55xx DN xxx **-041**	Valve without control- or interrogation system
55xx DN xxx **-750**	Valve with Sensor mounting set (5630 005 000-020)
55xx DN xxx **-6xx**	Control head ASi-Bus Typ 5630
55xx DN xxx **-K6xx**	Control head ASi-Bus Typ 5631 KI-Top
55xx DN xxx **-5xx**	Control head SPS Typ 5630
55xx DN xxx **-K5xx**	Control head SPS Typ 5631 KI-Top

DN - Nominal pipe size e.g. 572x 050 130-041

KIESELMANN
FLUID PROCESS GROUP

Declaration of incorporation

Translation of the original

Manufacturer / authorised representative:

KIESELMANN GmbH
Paul-Kieselmann-Str. 4-10
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Authorised representative,
for compiling technical documents:

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KIESELMANN GmbH
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75438 Knittlingen
Germany

Product name	**Function**
pneum. Lift actuators	Stroke movement
pneum. Rotary actuators	Rotary movement
Ball valves	Media cutoff
Butterfly valves	Media cutoff
Single seat valves	Media cutoff
Flow control valves	Control of liquefied media
Throttle valve	Control of liquefied media
Overflow valve	Definition of fluid pressure
Double seat valve	Media separation
Bellow valves	Sampling of liquids
Sampling valves	Sampling of liquids
Two way valves	Media cutoff
Tankdome fitting	Prevention of overpressure and vacuum, Tank cleaning

The manufacturer hereby states that the above product is considered as an incomplete machine in the sense defined in the Directive 2006/42/EC on Machinery. The above product is exclusively intended to be installed into a machine or an incomplete machine. The said product does not yet conform to all the relevant requirements defined in the Directive on Machinery referred to above for this reason.

The specific technical documents listed in Appendix VII, Part B, have been prepared. The Authorized Agent empowered to compile technical documents may submit the relevant documents if such a request has been properly justified.

Commissioning of an incomplete machine may only be carried out if it has been determined that the respective machine into which the incomplete machine is to be installed conforms to the regulations set out in the Directive on Machinery referred to above.

The above product conforms to the requirements of the directives and harmonized standards specified below:

- DIN EN ISO 12100 Safety of machinery

Knittlingen, 10. 09. 2015

Klaus Dohle
General Director